PSD Non-Applicability Application:

Use of Alternate Fuels in Cement Manufacturing

October 2012

ESSROC San Juan, Inc.
Dorado, Puerto Rico

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FINAL REPORT

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ERM Project: 0171815

Environmental Resources Management
City Tower Building
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EXECUTIVE SUMMARY

ESSROC is an industry dedicated to the manufacture of Portland cement. The company is located at the end of Guarisco Way in Barrio Espinosa of the Municipality of Dorado. Currently, the kiln (emission unit 501) is permitted and operational for the production of clinker, the forerunner of cement.

The kiln is a dry, pre-heater/pre-calciner rotary type unit which uses coal and on-specification used oil as a fuel to produce the energy necessary for the manufacturing of clinker. The ESSROC facility plans to add the use of alternative fuels in their operations to substitute for the use of coal which is considered a fossil fuel.

The practice of using alternative fuels in cement kilns is well documented. The U.S. EPA and the European Union continue to promote the use of alternative fuels for cement kilns in preference to fossil fuels1. It is important to note that biogenic fuels have been widely permitted for control and reduction of Greenhouse Gases (GHG) for Prevention of Significant Deterioration (PSD) purposes2.

The process of clinker production in kiln systems creates favorable conditions for use of alternative fuels. These include: high temperatures, long residence times, an oxidizing atmosphere, alkaline environment, ash retention in clinker, and high thermal inertia. These conditions ensure that the fuel's organic part is destroyed and the inorganic part, including heavy metals is trapped and combined in the product.

ESSROC proposes to add the following alternative fuels to their facility to be co-processed or to substitute for the use of coal:

- Biomass
  - Cellulosic Biomass (i.e. agricultural biogenic materials such as rice husk, coffee husk, etc.).
  - Other Cellulosic Biomass (i.e. wood pallets)
  - Biosolids (i.e. sewage sludge)

[1] EPA Cement Sector Report, Trends in Beneficial Use of Alternative Fuels and Raw materials, October 2008.

[2] Greenhouse Gas Best Avilable Control Technology for Ravena Modernization Project.

The use of alternative fuels to be co-processed or to substitute for coal will reduce the environmental footprint and the global warming impacts of ESSROC. The alternative fuels listed do not represent an increase in any current permitted emissions limit, as ESSROC had already been in compliance. ESSROC will maintain the actual emission limits. In this document ESSROC will demonstrate that federal PSD requirements are not applicable to the proposed project. As necessary, ESSROC will amend its current construction and Title V permits issued by the Puerto Rico Environmental Quality Board (PR-EQB).

This document is the support for ESSROC's request for a US-EPA determination that it is adequately demonstrated that a PSD Pre-Construction Permit is not required to implement the proposed changes. It will describe the proposed changes, calculate emission rates, and demonstrate compliance with all applicable air quality regulations.

1 PROPOSED OPERATIONAL CHANGES

1.1 PURPOSE AND NEED

The manufacturing of clinker is an energy intensive process due to the high temperatures required in the kilns for clinkerization[3]. ESSROC is looking for environmentally sound alternatives to reduce the dependency on coal, a fossil fuel, and to take advantages of the benefits of using alternative fuels to generate the energy needed for the manufacturing of clinker. The co-processing or the substitution of coal with alternative fuels in the ESSROC process will be ecologically beneficial, for two reasons: the conservation of non-renewable resources and the reduction of waste disposal requirements.

The alternatives evaluated by ESSROC include the use of alternate fuels which will be co-processed or substituted for 90,000 tons of coal which are used as the fuel source to produce the energy needed for the production of clinker. The alternative fuels which are classified as biomass to be used by ESSROC are: cellulosic biomass (i.e., agricultural by products: rice husk, coffee husk, etc.), other cellulosic biomass (i.e., wood pallets) and biosolids.

Based on a conservative presumption of 100 percent heat value[4] of alternative fuels relative to coal, the maximum annual input of alternative fuels that is needed to supply the heat will be equivalent to 198,000 tons per year. The handling, storage, processing and injection of the alternative fuels will be done using the current equipment used at ESSROC to handle the coal. Since the percent of moisture of the alternative fuels is higher than coal, the emissions will be below the particulate matter emissions established in the ESSROC's permit. In case it is needed, dust suppression will be used in the storage areas and any stored alternative fuel material causing nuisance odors will be removed from the site.

The alternative fuels requested to be used in the ESSROC cement kiln would alternatively have been landfilled. Their use in cement kilns replaces fossil fuels and maximizes the recovery of energy. Employing alternative fuels in cement plants is an important element of a sound waste management policy.

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[3] Murray & Price 2008

[4] An average of 22 MMBtu/ton of heat value for coal and 10 MMBtu/ton heat value for the alternative fuel. The rate is approximately one pound of coal per 2.2 pounds of alternative fuel.

This practice promotes a vigorous and thriving materials recovery and recycling industry[5].

This type of energy recovery conserves not only the valuable fossil fuels for future generations but also safely destroys wastes that would otherwise be deposited in landfills. This project does not contemplate the installation or modification of the kiln or the increase in clinker production.

1.2 *EXISTING FACILITIES*

ESSROC San Juan, Inc. (ESSROC) is a company dedicated to Portland Cement Manufacturing, located in Dorado, Puerto Rico. ESSROC is permitted to produce up to 682,550 tons per year (TPY) of clinker, an intermediate product, resulting from the processing of limestone and other raw materials in a rotary kiln. The total Portland cement manufacturing is limited to 850,000 TPY.

Currently, ESSROC is using 90,000 tons per year of coal and 18,851,691 gallons per year (69,657 tons per year) of on-specification used oil as a fuel to produce the energy necessary for the manufacturing of clinker.

1.3 *PROCESS DESCRIPTION*

The production of Portland cement is an energy intensive process. The process for the production of clinker is an operation in which the cement pyroprocessing systems employ countercurrent flow to achieve heat transfer from the hot combustion products to the relatively cold raw materials. The temperature profiles of the four basic cement plant process types are quite different but the raw materials are essentially the same, and the final product is physically and chemically similar, i.e., the hard, gray, spherical nodules of hydraulic minerals called Portland cement clinker (clinker).

The rotary cement kiln is common to all cement pyroprocessing systems, and it is in this device that the raw materials are converted to clinker. Regardless of the pyroprocessing system, the raw materials are heated to incipient fusion at about 1480°C (2700°F) by an approximately 1870°C (3400°F) flame in the hottest section of the rotary kiln, i.e., the "burning zone." Because of their characteristic physical configurations and temperature profiles, the respective pyroprocesses can present different emission rates of some gaseous pollutants while using the same raw materials and fuels.

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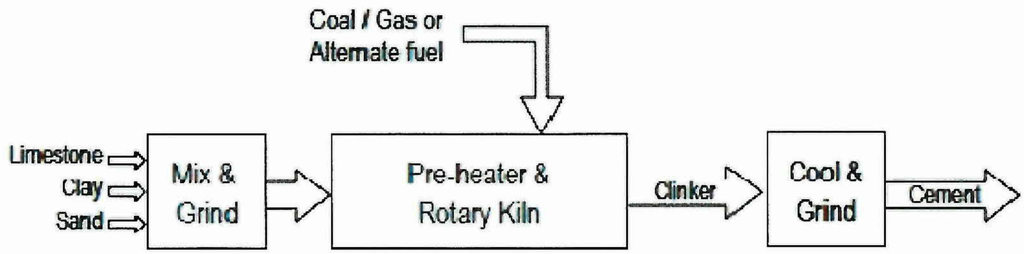
[5] Cembureau, 1999

Figure 1.1 Flowchart of Clinker Manufacturing Process



The process of clinker production in kiln systems creates conditions for the use of alternative fuels. The pyroprocessing system provides high temperatures, long residence times, an oxidizing atmosphere, alkaline environment, ash retention in clinker, and high thermal inertia. These conditions ensure that the fuel's organic part is destroyed and the inorganic part, including heavy metals, is trapped and combined in the product.

Alternative fuels that are being considered by ESSROC are biomass that can be classified as follows: cellulosic biomass (i.e., agricultural by-products: rice husk, coffee husk, etc.), other cellulosic biomass (i.e., wood pallets) and biosolids. The efficient thermal combustion of alternative fuels in a cement kiln provides for the utilization of materials for their heat content that would otherwise be landfilled, and the ash provides essential ingredients (silica, aluminum, calcium, iron, etc.) and becomes a component of the final product.

The use of the alternative fuels in the cement kiln will replace part of the fossil fuels and maximizes the recovery of energy at ESSROC. The term used to describe the combination of a fossil fuel (i.e. coal) and other alternative fuels is called co-processing.

Research carried out for a number of years in cement plants all over the world has clearly shown the advantages of using alternative fuels in the clinkering processes and cement production. Industrialized countries have over 20 years of successful experience using alternative fuels. In the U.S., it is common for cement plants to derive 20-70% of their energy needs from alternative fuels[6].

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[6] Murray & Price, 2008

The use of alternative fuels has the potential to reduce emissions to the environment by replacing the use of conventional fossil fuels with materials that would otherwise have to be landfilled with the corresponding emissions.

The calorific value must be stable enough to allow the control of the energy supply to the kiln. As Willitsch et.al., 2009 reported, for continuously running operation of the cement kiln, the calorific value should not be less than the limit of 15.48 MMBtu/ton fuel.

1.3.1 *Co-processing of fuel and fuel substitution*

The most important decision for a cement manufacturing facility is the selection of the fuels to generate the extremely high kiln temperature necessary to manufacture clinker. The large quantity of fuel necessary to produce quality clinker on a consistent basis is one of a cement manufacturing facility's largest concerns in terms of the product's quality control and cost. At this time ESSROC is using coal and on-specification used oil to produce the energy necessary in the manufacturing process.

With the addition of alternative fuels ESSROC will be able to reduce the use of coal which is considered a fossil fuel. ESSROC plans the co-processing or substitution of up to 100 percent of coal with alternative fuels. The alternate material will be mixed with the coal or used as a substitute fuel to produce the energy needed in the manufacturing of Portland cement.

This project does not require the installation, construction or modification of the kiln or the handling and storage facilities. The alternative fuel will be handled and stored in the same system that currently is used for the handling of coal.

Some of the benefits of using alternative fuels identified by the cement industry are:

- Reduces the use of non-renewable fossil fuels such as coal as well as the environmental impacts associated with coal mining;
- Contributes towards a lowering of emissions such as greenhouse gases by replacing the use of fossil fuels with materials that would otherwise have to be incinerated or landfilled with corresponding emissions and final residues;
- Maximizes the recovery of energy from the alternative fuel material. All the energy is used directly in the kiln for clinker production. It also maximizes the recovery of the non-combustible part of the alternative

fuel material and eliminates the need for disposal of slag or ash, as the inorganic part substitutes raw material in the cement.[7]

The increase in use of alternative fuels is a trend for the cement manufacturing industry around the world.

1.3.2 *Impact of Co-processing or Fuel substitution on Kiln Emissions*

The clinker manufacturing process in kiln systems creates favorable conditions for the use of alternative fuels. These include: high temperatures, long residence times, an oxidizing atmosphere, alkaline environment, ash retention in clinker, and high thermal inertia. These conditions ensure that the fuel's organic part is destroyed and the inorganic part, including heavy metals, is trapped and combined in the product.

The cement industry published in January 2009 a paper entitled, "Processing of Alternative Fuels and Raw Materials in the European Cement Industry" and produced by CEMBUREAU, the European Cement Association based in Brussels (a representative organization of the cement industry in Europe), which describes the changes in the emissions by using alternative fuels.

- Sulfur Oxides (SO_2): alternative solid fuels have no influence on total SO_2 emissions.
- Nitrogen Oxides (NO_x): alternative fuels do not lead to higher NO_x emissions - in some cases, NO_x emissions can even be lower.
- Total Organic Carbon (TOC): there is no correlation between the use of alternative fuels and emissions levels.
- Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans (PCDD/PCDF): no difference has been found in dioxin emissions when alternative fuels are used compared to conventional fuels.
- Hydrogen Chloride (HCl): emissions vary irrespective of the fuel used.
- Hydrogen Fluoride (HF): there is very little difference in HF emissions when using alternative fuels.

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[7] CEMBUREAU, *Alternative Fuels in Cement Manufacture - Technical and Environmental Review*, p. 3, 1997.

- Heavy Metals: emissions vary irrespective of the fuel and raw materials used. However, nearly 100% of them remain either in the cement clinker matrix or in the cement kiln dust as non-leachable compounds. In any event, alternative fuels undergo a rigorous acceptance and inspection procedure before being used.

- Dust: dust emissions taken under both fuel regimes indicate no difference between the two.

In the state of Florida the following facilities are co-processing alternative fuels as a replacement of coal or other fossil fuels used in their facility to generate the energy needed for the manufacturing of clinker.

Table 1.1 Florida Plants using Alternative Fuels

Facility	Location	Fuel Types Used
CEMEX	Brooksville, FL	· Whole Tires · Plastics - Agricultural Film · Tire Derived Fuel · Reject Roofing Shingles · Clean Woody Biomass · Agricultural Byproducts · Pre-consumer Reject Paper · Carpet Derived Fuel
Vulcan	Newberry, FL	· Whole Tires · Pre-consumer Reject Paper
American Cement Company	Sumter county, FL	· Whole Tires
CEMEX	Miami, FL	· Tire Fluff · Biomass · Whole Tires
Suwannee American Cement	Branford, FL	· Autofluff (expired permit) · Plastics Agricultural Film · Tire Derived Fuel · Reject Roofing Shingles · Used Roofing Shingle Scraps · Clean Woody Biomass · Agricultural Byproducts · Pre-consumer Paper · Post-consumer Paper · Carpet Derived Fuel
Titan America AKA Tarmac Pennsuco	Miami, FL	· Whole Tires · Plastics · Tire Derived Fuel · Reject Roofing Shingles · Clean/Manufactured Cellulosic Biomass · Agricultural Byproducts · Pre-consumer Paper · Carpet Derived Fuel

1.4 DESCRIPTION OF ALTERNATIVE FUELS

The following is a description of the alternative fuels that will be co-processed or used as a substitution for coal:

1.4.1 *Biomass*

Biomass is an energy that is stored in organic, biological material made from the sun made by living organisms. Plants use energy from the sun to convert into energy. This is done during the process of photosynthesis.

The U.S. EPA defined biomass as a non-fossilized and biodegradable organic material originating from plants, animals or micro-organisms, including products, by-products, residues and waste from agriculture, forestry and related industries as well as the non-fossilized and biodegradable organic fractions of industrial and municipal wastes, including gases and liquids recovered from the decomposition of non-fossilized and biodegradable organic material[8].

The U.S. EPA established that using alternative fuels such as biomass may have additional benefits, including displacing purchased fossil fuel, freeing up landfill space, and reducing tipping fees associated with waste disposal.

ESSROC identified the types of biomass that can be co-processed or used in substitution of coal to supply part of the energy need in the manufacturing of clinker. They are listed below.

1.4.1.1 *Clean cellulosic biomass*

This material is readily available and includes clean untreated lumber, tree stumps, millings, shavings and processed pellets made from wood or other forest residues. The biomass will come from permitted material recycling facilities or companies that service tree trimming operations.

Depending on the material content, there may be slight increases of CO, PM/PM10 and VOC when firing clean woody biomass versus firing an equivalent heat input rate of coal. These materials can provide significant heat contents and parameters acceptable for kiln firing.

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[8] §98.6

The U.S. EPA in 40 CFR Part 241 has established requirements and procedures that identify whether the definition of solid waste applies to non-hazardous secondary materials burned as fuel or used as ingredients in combustion units. According to §241.2 clean cellulosic biomass means:

...those residuals that are akin to traditional cellulosic biomass such as forest-derived biomass (e.g., green wood, forest thinnings, clean and unadulterated bark, sawdust, trim, and tree harvesting residuals from logging and sawmill materials), corn stover and other biomass crops used specifically for energy production (e.g., energy cane, other fast growing grasses), bagasse and other crop residues (e.g., peanut shells), wood collected from forest fire clearance activities, trees and clean wood found in disaster debris, clean biomass from land clearing operations, and clean construction and demolition wood. These fuels are not secondary materials or solid wastes unless discarded. Clean biomass is biomass that does not contain contaminants at concentrations not normally associated with virgin biomass materials.

The climate neutrality of CO_2 emissions from biomass combustion is broadly accepted in the literature; the use of biomass is also seen as an effective way to reduce greenhouse gases (International Energy Agency, 2009; Holcim, 2007; LaFarge, 2003) and fossil fuel requirements (Heidelberg, 2007b; Holcim, 2007; LaFarge, 2003; LaFarge, 2009a; LaFarge, 2009b). In addition, due to its readily available supply, when local biomass is used, transportation impacts are also reduced (LaFarge, 2003).

According to Royo et al. (2007), using biomass implies low SO_2 emissions, low dioxin and furan emissions, and very low heavy metal emissions.

A study performed in 2010 at a Cemex Cement Plant in Miami, FL using woody biomass concluded that the emissions were comparable to the use of traditional fuels.

The cellulosic biomass that will be co-processed or used as substitute of coal will have an average heating value of 10 - 14 MM Btu/ton.

1.4.1.2 *Other cellulosic biomass*

This category does not comply with the definition of untreated cellulosic biomass. These include discarded consumer products and wood residues from non-primary mill manufacturers, wooden furniture, cabinets, pallets and containers, and scrap lumber.

The average heating value of other cellulosic biomass to be co-processed or used to substitute the coal is estimated to be between 10 – 12 MM BTU/ton.

1.4.2 *Biosolids*

Biosolids are generated primarily from municipal wastewater treatment plants (WWTP). In 40 CFR Part 503, the EPA categorized biosolids as Class A or B, depending on the level of pathogenic organisms in the material. The classification of biosolids affects the feasibility of a cement plant to use the biosolids. ESSROC plans to use the Class A biosolids because of regulatory issues and materials handling issues if it uses Class B biosolids.

ESSROC will assure that the supplier of the biosolids will comply with the requirements of 40 CFR Part 503 for the specific treatment processes and treatment conditions that must be met for Class A biosolids. Studies demonstrate that Class A biosolids contain minimal levels of pathogens. To achieve Class A certification, biosolids must undergo heating, composting, digestion, or increased pH that reduces pathogens to below detectable levels. After treatment to reduce moisture content, the calorific value of biosolids may range from 7,000-8,000 British thermal units (BTUs) per pound.

Biosolids are used as an alternative fuel and are currently available in Puerto Rico. At this time, the biosolids are disposed of in landfills. The use of the biosolids as an alternative fuel at ESSROC will provide other alternatives for the disposal of the biosolids in a safe manner.

1.5 AIR PERMITS MODIFICATIONS RELATED TO THE USE OF ALTERNATIVE FUELS

The Project consists primarily of the co-processing or substitution of coal with alternative fuels such as biomass and biosolids. The use of the alternative fuels will not increase the emissions from the facility and does not include the installation or construction of new equipment. The alternative fuels will be handled at the facilities already permitted.

Accordingly, ESSROC is hereby submitting its formal request for determination that ESSROC has adequately demonstrated that a Prevention of Significant Deterioration (PSD) Pre-Construction Permit is not required to implement the proposed changes.

The Air Location Sitting Approval Permit (Rule 201) of the Control of Atmospheric Pollution is not required for the same reasons that make PSD non-applicable to this project. In addition, ESSROC will incorporate any permitted changes in the Title V Operating Permit.

Section 2 has a detailed description of the emissions and the procedures to estimate them.

2 CURRENT PERMITTED, ACTUAL, AND PROJECTED FUTURE EMISSION RATES AT THE ESSROC FACILITY

This section contains air emission rate information relevant to the evaluation being performed for the ESSROC facility in Dorado. The analysis below lists:

- Current permitted emission limits, based on the most recent air permit issued by the US-EPA, Region 2
- Contemporaneous actual emission rates (average of 24 consecutive months), going back the last ten full calendar years, and
- Projected future emissions after the implementation of the proposed changes.

2.1 PERMITTED EMISSIONS

The ESSROC facility in Dorado has been operating and currently operates under a Construction Permit issued by the EQB incorporating conditions requested by the EPA, Region 2 to avoid applicability of the federal Prevention of Significant Deterioration (PSD) requirements. Current plantwide emission limits, summarized in **Table 2.1** below, are based on limits that appear in the final permit and requested limits in the permit application. Emission limits are annual, in tons per year (TPY) and normalized to clinker production (lb. per ton of clinker produced), based on the maximum allowable annual clinker production rate of 682,550 tons per year. For SO2, emissions calculations are estimated taking into consideration the percent of sulfur in the fuel.

Table 2.1 ***ESSROC's Current Plantwide Permitted Emissions***

Pollutant	Potential to Emit (tons/yr)	Normalized Emission Limit (lb/ton clinker)
Nitrogen Oxides (NOx)	1,433	4.2
Sulfur Dioxide (SO2)	450	**
Carbon Monoxide (CO)	1262.72	3.7
Total Particulate Matter (PM)	134.5	0.34
Particulate Matter Less Than 10 Microns (PM10)	134.5	0.34
Lead (Pb)	0.00256	7.5X10-5
Volatile Organic Compounds (VOC)	40.95	0.12

2.2 CONTEMPORANEOUS (BASELINE) EMISSION RATES

Contemporaneous actual emissions were computed as part of the process to determine PSD applicability of the proposed changes to the cement manufacturing. ESSROC has kept records of actual emissions based on actual clinker production. Emission estimations are derived from the normalized emission limits listed above in pounds per ton of clinker produced and actual clinker production each calendar year. Per PSD requirements, **Table 2.2** below lists actual annual clinker production of the last ten calendar years.

Table 2.2 ***Historic Annual Actual Clinker Production Rates***

Year	Clinker Production (tons/yr)
2002	520,147
2003	574,065
2004	578,092
2005	581,434
2006	562,663
2007	409,325
2008	362,846
2009	311,546
2010	255,288
2011	255,288

ESSROC must select a 24-consecutive month period within the most recent ten years for its baseline evaluation. ESSROC selected the period from 2005 through 2006. During that time, the facility produced 1,144,097 tons of clinker equal to an annualized rate of 572,049 tons of clinker per year. Baseline emissions of PSD-regulated compounds were determined based on normalized, actual emission rates (in pounds of emission per ton of clinker).

Table 2.3 ***ESSROC's Current Baseline Emissions Permitted Average Years: 2005 & 2006***

Pollutant	Normalized Emission Limit (lb/ton clinker)	Baseline Actual Emissions (ton/year)
Nitrogen Oxides (NOx)	4.2	1,201.3
Sulfur Dioxide (SO_2)	NA**	344.22
Carbon Monoxide (CO)	3.7	1,058.29
Total Particulate Matter (PM)	0.34	97.24
Particulate Matter Less Than 10 Microns (PM_{10})	0.34	97.24
Lead (Pb)	7.5X10-5	0.02
Volatile Organic Compounds (VOC)	0.12	34.32

**75% absorption of sulfur into clinker (AP-42, Supplement 5, page 11.6-6)

According to the U.S. EPA the emissions factors at cement plant facilities do not depend on the fuel consumption being used in the manufacturing of the clinker. Therefore, the emissions estimates using alternative fuels will not affect the potential to emit of the facility.

2.3 SUMMARY OF PROJECTED ACTUAL EMISSIONS RATES FROM CEMENT MANUFACTURING AFTER PROPOSED CHANGES ARE IMPLEMENTED

ESSROC proposes that for the other regulated compounds, the co-processing of biomass at the cement facility will not change their normalized emission rates, based on the current permit limit. The projected actual emission rates (in TPY) of each regulated compound based on the current maximum allowable production rate of clinker, 682,550 TPY, and the current permit limits, are summarized in **Table 2.4** Summary of Projected Actual Emission Rates. This table shows the projected emission rates resulting from the maximum utilization of clinker production.

Table 2.4 ***Summary of Projected Actual Emission Rates Using Alternative Fuel (AF) at ESSROC***

Pollutant	Potential to Emit (tons/yr)	Normalized Emission Limit (lb/ton clinker)
Nitrogen Oxides (NOx)	1,433	4.2
Sulfur Dioxide (SO_2)	450**	NA - Only TPY limit**
Carbon Monoxide (CO)	1262.72	3.7
Total Particulate Matter (PM)	134.5	0.34
Particulate Matter Less Than 10 Microns (PM_{10})	134.5	0.34
Lead (Pb)	0.00256	7.5X10-5
Volatile Organic Compounds (VOC)	40.95	0.12

**75% absorption of sulfur into clinker (AP-42, Supplement 5, page 11.6-6)

3 AIR REGULATORY EVALUATION

The changes that ESSROC proposes to implement at its cement manufacturing plant in Dorado, PR may cause emission rates of regulated pollutants to change due to the requirement to include the emissions from the co-processing or substitution of coal with alternative fuels. Therefore, there is the potential that some federal and Puerto Rico air quality regulations may be applicable and need to be addressed. This section evaluates federal and state air quality regulations, reviews those that may be applicable, and evaluates which ones are applicable and how ESSROC proposes to comply with every applicable air quality regulation.

3.1 PREVENTION OF SIGNIFICANT DETERIORATION

The Prevention of Significant Deterioration (PSD) program is contained in 40 Code of Federal Regulations (CFR) Parts 51 through 53. In short, PSD regulates certain major facilities proposing to incorporate changes that cause a "significant" increase in emissions of a regulated compound. Facilities subject to PSD must make special provisions to ensure that a National Ambient Air Quality Standard (NAAQS) is not exceeded or unduly approached.

PSD applicability is a two-step process. The first step is to determine if the facility is a major source as defined under PSD. The major source definition is different from the major source definition for Title V sources in 40 CFR Part 70. The PSD rules establish that for 28 listed industrial categories, a source is major if it has the potential to emit at least 100 TPY of a regulated pollutant. Portland cement manufacturing is one of the 28 industrial categories listed. The existing ESSROC facility does have the potential to emit at least one regulated pollutant at an annual rate exceeding 100 TPY. Therefore, the ESSROC facility meets the first applicability criteria under PSD rules.

The second step is to determine whether a proposed net emission increase of a regulated pollutant is classified as significant, as defined under PSD rules. For an existing facility PSD requires an applicant to determine the baseline emissions. The baseline actual emission is the average rate at which the unit actually emitted the pollutant in a 24-month period looking back ten years.

Then, for each regulated pollutant, the applicant must estimate the projected actual emissions. This is defined in 40 CFR Part 52.21(b)(41) as:

(i) *Projected actual emissions* means the maximum annual rate, in tons per year, at which an existing emissions unit is projected to emit a regulated New Source Review (NSR) pollutant in any one of the five years (12-month period) following the date the unit resumes regular operation after the project, or in any one of the ten years following that date, if the project involves increasing the emissions unit's design capacity or its potential to emit that regulated NSR pollutant and full utilization of the unit would result in a significant emissions increase or a significant net emissions increase at the major stationary source.

(ii) In determining the projected actual emissions under paragraph (b)(41)(i) of this section (before beginning actual construction), the owner or operator of the major stationary source:

> (a) "Shall consider all relevant information, including but not limited to, historical operational data, the company's own representations, the company's expected business activity and the company's highest projections of business activity, the company's filings with the state or federal regulatory authorities, and compliance plans under the approved State Implementation Plan; and
>
> (b) Shall include fugitive emissions to the extent quantifiable and emissions associated with startups, shutdowns, and malfunctions; and
>
> (c) Shall exclude, in calculating any increase in emissions that results from the particular project, that portion of the unit's emissions following the project that an existing unit could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions under paragraph (b)(48) of this section and that are also unrelated to the particular project, including any increased utilization due to product demand growth; or
>
> (d) In lieu of using the method set out in paragraphs (a)(41)(ii)(a) through (c) of this section, may elect to use the emissions unit's potential to emit, in tons per year, as defined under paragraph (b)(4) of this section."

Historically, the determination of the net emissions increase has been based on the net increase in annual emissions before and after a proposed change. Annual emissions are determined by (1) the hourly emission rate or emission factor potentially affected by the proposed change at the plant and (2) the relative projected future use of the equipment in question compared to the baseline rate. If the baseline emission rate was based on equipment utilization below capacity, a change could have triggered PSD applicability if the applicant merely requested resuming operation at capacity.

Modifications of the PSD rule published in the Federal Register on December 31, 2002 changed this procedure, including the definition of *projected actual emissions* noted above. Please note Section (ii)(c), allowing the exclusion of any factor in calculating projected actual emissions unrelated to the particular proposed change, including increased utilization due to demand growth. Therefore, the *demand growth exclusion* allows appropriate net emission increases to be excluded from determining PSD applicability. Determination of PSD applicability must be based on differences in past actual and projected future emissions caused by the actual proposed physical change(s) and not differences in clinker production rates.

If a net emissions increase of a pollutant exceeds a PSD significance threshold, then the facility has met the second step of the process, and the pollutant is subject to PSD review. It is possible that a proposed modification would have certain pollutants subject to PSD review and others exempt.

Should a proposed modification at a major facility result in a significant emissions increase, as defined by PSD, the applicant must receive a PSD Pre-Construction Permit before the modification is implemented. The facility must install Best Available Control Technology (BACT) for all applicable pollutants. This is broadly defined as the most stringent control strategy taking into consideration economic, energy, and environmental factors. In addition, the applicant must perform an approved dispersion modeling study to demonstrate that the additional ground-level impacts of the compounds in question will not cause a National Ambient Air Quality Standard (NAAQS) or a PSD increment level to be exceeded.

3.2 BASELINE ACTUAL EMISSIONS

Baseline actual emissions are determined based on the information provided in Section 2.2. Emission rates are determined for the cement kiln, as emissions from other supplementary sources (clinker cooler, transportation baghouses, silos, etc.) will not change due to the proposed co-processing or substitution of coal.

Baseline actual emissions were chosen for a 24-month period of operation at the facility over the past ten years. ESSROC used the period of 2005 through 2006 to determine baseline emissions. The proposed PSD baseline actual emission rates based on the existing cement kiln system are included on **Table 3.1**.

3.3 *DETERMINATION OF PSD APPLICABILITY*

ESSROC proposes that the co-processing or substitution of coal with alternative fuels will not change the current actual emission factors. Therefore, the plant change will keep all the normalized, production-based permitted emission rates steady or reduced. **Table 3.1** below compares past and projected future emission factors for PSD-regulated compounds.

Table 3.1 ***Summary Comparison of existing and Projected Future Emission Factors (lb/ton clinker produced)***

Pollutant	Existing Emissions Factors	Projected Future Emission Factors
Nitrogen Oxides (NOx)	4.2 lb/ton clinker	4.2 lb/ton clinker
Sulfur Dioxide (SO_2)	450 tons per year **	450 tons per year **
Carbon Monoxide (CO)	3.7 lb/ton clinker	3.7 lb/ton clinker
Total Particulate Matter (PM)	0.34 lb/ton clinker	0.34 lb/ton clinker
Particulate Matter Less Than 10 Microns (PM_{10})	0.34 lb/ton clinker	0.34 lb/ton clinker
Lead (Pb)	7.5X10-5 lb/ton clinker	7.5X10-5 lb/ton clinker
Volatile Organic Compounds (VOC)	0.12 lb/ton clinker	0.12 lb/ton clinker

**75% absorption of sulfur into clinker (AP-42, Supplement 5, page 11.6-6)

Any increase in future mass annual emission rates will arise not because of the proposed changes in operation, but because of a possible increased future clinker production (demand) rate compared to the baseline manufacturing rate. In the historic and future cases, these manufacturing rates have been and will continue to be at or below the permitted allowable annual production limit. Therefore, the entire project falls under the demand growth exclusion portion of PSD, and is not PSD applicable. In addition, a comparison of baseline and projected future actual emissions is not necessary.

This is supported by the State of Florida Department of Environmental Protection (FDEP) for the addition of biomass alternative fuels at several operating cement production facilities at various locations. The FDEP has stated "total project emissions are not expected to exceed the PSD significant emissions rates; therefore, the project is not subject to PSD preconstruction review" and "the Department concludes that the addition and use of AF described in the application shall (n)ot cause a PSD-significant emissions increase...".[9]

3.4 PREVENTION OF SIGNIFICANT DETERIORATION (PSD) AND TITLE V GREENHOUSE GAS TAILORING RULE

On June 3, 2010, the EPA published the final Prevention of Significant Deterioration (PSD) and Title V Greenhouse Gas Tailoring Rule (herein referred to as the Tailoring Rule; 75 FR 31514), setting thresholds for GHG emissions that define when permits under these programs are required for new and existing industrial facilities. Beginning January 2, 2011, sources currently subject to PSD or Title V permitting programs were required to determine the best available control technology (BACT) for their GHG emissions, but only for GHG increases of 75,000 short TPY or more of total GHGs, on a carbon dioxide equivalents (CO2e) basis and any increase on a mass basis. At that time, no sources would be subject to CAA permitting requirements due solely to GHG emissions[10].

Beginning July 1, 2011, the PSD permitting requirements for the first time covered new construction projects that will emit GHGs of at least 100,000 TPY on a CO2e basis even if they do not exceed the permitting thresholds for any other pollutant. Modifications at existing facilities that increase GHG emissions by at least 75,000 TPY, and any amount on a mass basis, will be subject to permitting requirements, even if they do not significantly increase emissions of any other pollutant. Operating permit requirements will, for the first time, apply to sources based on their GHG emissions even if they would not apply based on emissions of any other pollutant. Facilities that emit at least 100,000 TPY CO2e will be subject to Title V permitting requirements[11].

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9 TECHNICAL EVALUATION & PRELIMINARY DETERMINATION, Suwannee American Cement, LLC, Branford Cement Plant, Project No. 1210465-023-AC, February 16, 2012.
TECHNICAL EVALUATION & PRELIMINARY DETERMINATION, CEMEX Materials and Construction, Florida, LLC, Miami Cement Plant, Project No. 0250014-045-AC, March 29, 2012.
TECHNICAL EVALUATION & PRELIMINARY DETERMINATION, CEMEX Materials and Construction, Florida, LLC, Brooksville South Cement Plant, Project No. 0530021-039-AC, March 27, 2012.
TECHNICAL EVALUATION & PRELIMINARY DETERMINATION, Tarmac American, LLC, Pennsuco Complex, Project No. 0250020-031-AC, July 15, 2011.

10 76 FR 43491

11 76 FR 43492

In accordance to the requirements of this rule, ESSROC reported the emissions of the greenhouse gases for the FY 2010. The emissions were the following:

Table 3.2 ***Total Facility Emissions in metric tons CO2e (excluding Biogenic CO2)***12

Pollutant	2010
Carbon Dioxide Equivalent	139,401

The EPA deferred determination of PSD applicability for CO2 combustion of biogenic materials after July 20, 2014 per 40 CFR 51.166, and states:

For purposes of this paragraph (b)(48)(ii)(a), prior to July 21, 2014, the mass of the greenhouse gas carbon dioxide shall not include carbon dioxide emissions resulting from the combustion or decomposition of non-fossilized and biodegradable organic material originating from plants, animals, or micro-organisms (including products, by-products, residues and waste from agriculture, forestry and related industries as well as the non-fossilized and biodegradable organic fractions of industrial and municipal wastes, including gases and liquids recovered from the decomposition of nonfossilized and biodegradable organic material).

3.5 NONATTAINMENT NEW SOURCE REVIEW

Nonattainment New Source Review (NSR) regulations apply to project sites in which at least one NAAQS is not met. Typical NSR rules have some similarities to PSD, but are more stringent.

Puerto Rico is in attainment with all NAAQS. Therefore, NSR does not apply to any proposed modification of a facility on the Island.

3.6 NEW SOURCE PERFORMANCE STANDARDS

Federal New Source Performance Standards (NSPS) apply to facilities in a given source category built new or modified after a certain published date.

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[12] http://ghgdata.epa.gov/ghgp/main.do#/facilityDetail/?q=Facility or Location&st=PR&fid=541477&lowE=0&highE=23000000&&g1=1&g2=1&g3=1&g4=1&g5=1&g6=1&g7=1&s1=1&s2=1&s3=1&s4=1&s5=1&s6=1&s7=1&s8=1&s9=1&s301=1&s302=1&s303=1&s304=1&s305=1&s306=1&s401=1&s402=1&s403=1&s404=1&s601=1&s602=1&s701=1&s702=1&s703=1&s704=1&s705=1&s706=1&s707=1&s708=1&s709=1&s710=1&s711=1&s801=1&s802=1&s803=1&s804=1&s805=1&s901=1&s902=1&s903=1&s904=1&s905=1&ss=&so=0&ds=E&yr=2010

ESSROC is affected by NSPS for Portland Cements Plant, 40 CFR 60 Subpart F. The NSPS affects the clinker manufacturing operations.

3.7 40 CFR Part 63 Subpart LLL - National Emission Standards for Hazardous Air Pollutants From Portland Cement Manufacturing Industry

The National Emission Standards for Hazardous Air Pollutants (NESHAP) is a series of rules applied to different industries for the enhanced control of 188 federally-listed hazardous air pollutants (HAPs). NESHAP requires an affected facility to install and operate Maximum Achievable Control Technology (MACT) to control those HAPs most likely to be emitted by the industry's processes. MACT is a stringent standard based on what facilities in the industry were achieving at the time the rule was being considered.

The emissions limits that must be met do not limit the types of materials that can be used in the kiln, other than a clarification that if the kiln burns hazardous waste, it would be subject to 40 CFR Part Subpart EEE. The emission limits established under Subpart LLL do not prohibit the use of non-hazardous discarded materials such as biomass. At this time the Subpart LLL requirements are already established in the current Title V permit.

4 APPENDIX

Appendix A

Actual Emissions Data and Calculations 2002 -2011

ESSROC's Current Baseline Emissions Permitted Average Years: 2005 & 2006

Pollutant	Normalized Emission Limit (lb/ton clinker)	Clinker Production[1] (tons/year)	Baseline Emissions (tons/year)
Nitrogen Oxides (NOx)	4.2	572,049	1201.30
Sulfur Dioxide[2] (SO_2)	NA	NA	344.22
Carbon Monoxide (CO)	3.7	572,049	1058.29
Total Particulate Matter (PM)	0.34	572,049	97.248
Particulate Matter Less Than 10 Microns (PM_{10})	0.34	572,049	97.248
Lead (Pb)	7.50E-05	572,049	0.02
Volatile Organic Compounds (VOC)	0.12	572,049	34.32

1. Clinker production is a 24-consecutive month period within the most recent 10 years. The years are 2005 and 2006.

2. Annual SO2 emissions based on 75% absorption into clinker (AP-42, Supplement 5, page 11.6-6).

ESSROC's Actual Emissions Years: 2002 to 2011

Year	Clinker Production (ton/year)	Pollutant Actual Emissions (tons/Year)						
		TSP	PM10	SOx	NOx	VOC	CO	Pb
2002	520,147	93.22	93.22	306.82	1,092.31	31.21	962.27	0.02
2003	574,065	102.88	102.88	297.29	1,205.54	34.44	1,062.02	0.02
2004	578,092	98.28	98.28	299.74	1213.99	34.69	1069.47	0.02
2005	581,434	104.22	104.22	348.09	1,221.01	34.89	1,075.65	0.02
2006	562,663	100.85	100.85	340.35	1,205.54	34.44	1,062.02	0.02
2007	409,325	73.37	73.37	297.29	1,181.59	33.76	1,040.93	0.02
2008	362,846	65.04	65.04	236.48	761.98	21.77	671.27	0.01
2009	311,546	55.84	55.84	191.80	654.25	18.69	576.36	0.01
2010	255,288	45.76	45.76	166.86	536.10	15.32	472.28	0.01
2011	255,288	45.76	45.76	166.86	536.10	15.32	472.28	0.01

Facility Emissions Summary Table

Facility Name		Facility ID No.			Unit No.	Year of Data
ESSROC- San Juan Plant					EU501	2002
POINT IDENTIFICATION						
Facility SIC Code			**Point Description**			
3241			Preheater / Kiln			
Source Classification Code (SCC)			**Emission Factor Unit**		**Actual Hours Operated in 2002**	
30500613, 30500622, 30500614			Clinker Produced		5,571 Roller Mill	
Source Description			**Emission Point No.**		**Actual Hours Operated in 2002**	
Roller Mill, Kiln			EP501,EP502		6,866 Kiln	
AIR POLLUTION CONTROL EQUIPMENT						
Device No.	**Description of Control Device**				**Pollutant**	**Efficiency (%)**
CD501	Baghouse #2				Particulate	99.9
CD502	Baghouse #3				Particulate	99.9
PROCESS INFORMATION						
Annual Throughput		**Units**	Fuel Oil Used for preheating (gal):		23810	
520,147 (Clinker)		Tons	Fuel Oil Used for preheating (ton):		81	
798,660 (Dry Kiln Feed)			**Baghouse**	**Flow Rate (ACFM)**	**Flow Rate (DSCFM)**	
Maximum Annual Throughput		**Units**	Baghouse #2	210,000	108,286	
682,550 (Clinker)			Baghouse #3	300,000	155,273	
1119,382 (Dry Kiln Feed)		Tons				
EMISSION CALCULATIONS						
Source of Emission Factor			**Allowable or Permissible Emission Limit**		PFE-26-0189-0051-I-II-C	**Units**
AP-42, 5th Ed., Sec. 11.6.2, Coal SO_2 Analysis.			TSP AND PM10:		134.50	tons/year
List other worksheets used with this form.			SO_2		450.00	tons/year
			NO_x		1,433.00	tons/year
None						

Air Pollutant	Emission Factor (Lbs/Unit)	Control Efficiency (%)	Actual Emissions (Lbs/Hr)	Actual Emissions (Tons/Yr)	Maximum Controlled (Tons/Yr)	Maximum Uncontrolled (Tons/Yr)	Allowable Emissions (Tons/Yr)
TSP	0.34 + 0.0012	99.9	NA	93.22	NA	NA	134.50
PM10	0.34 + 0.0012	99.9	NA	93.22	NA	NA	134.50
SOx		NA	NA	306.82	NA	NA	450.00
NOx	4.2	NA	NA	1,092.31	NA	NA	1,433.00
VOC	0.120	NA	NA	31.21	NA	40.95	NA
CO	3.700	NA	NA	962.27	NA	1,262.72	NA
Lead	7.50E-05	NA	NA	0.02	NA	0.03	NA

ADDITIONAL NOTES

Particulate matter emission factor is sum of Kiln and CC emission factors times the clinker production, plus the Roller Mill emission factor times the Dry kiln feed.

Dry kiln feed throughputs are equal to Roller Mill Circuit (EU301) throughputs.

Roller Mill Hours equal to Roller Mill Circuit (EU301) hours. Kiln hours from SJC 2002 operating report.

The NO_x, TSP, CO, VOC, and PM_{10} emission factors are for a preheater/precalciner kiln.

Annual SO2 emissions based on 0.76% (2002 average) Sulfur in Coal and 0.5% Sulfur in the Fuel Oil and 75% absorption into clinker (AP-42, Supplement 5, page 11.6-6).

Max SO_2 based on 1% sulfur in 90,000 TPY coal and 0.5% sulfur in Fuel oil #2 permit limit.

Allowable emissions based on application for permit to construct PFE-26-0189-0051-I-II-C and letter from I. H. Flashman (attorney for SJC) to F. Claudio (EQB) dated 3/18/97.

Facility Emissions Summary Table

Facility Name	Facility ID No.		Unit No.	Year of Data
ESSROC- San Juan Plant			EU501	2003

POINT IDENTIFICATION

Facility SIC Code 3241	**Point Description** Preheater / Kiln	
Source Classification Code (SCC) 30500613, 30500622, 30500614	**Emission Factor Unit** Clinker Produced	**Actual Hours Operated in 2003** 6,159 Roller Mill
Source Description Roller Mill, Kiln	**Emission Point No.** EP501,EP502	**Actual Hours Operated in 2003** 7,257 Kiln

AIR POLLUTION CONTROL EQUIPMENT

Device No.	Description of Control Device	Pollutant	Efficiency (%)
CD501	Baghouse #2	Particulate	99.9
CD502	Baghouse #3	Particulate	99.9

PROCESS INFORMATION

Annual Throughput	Units				
574,065 (Clinker)	Tons	Fuel Oil Used for preheating (gal):		5,600	
880,994 (Dry Kiln Feed)		Fuel Oil Used for preheating (ton):		21	
		Baghouse	**Flow Rate (ACFM)**	**Flow Rate (DSCFM)**	
Maximum Annual Throughput	**Units**	Baghouse #2	210,000	108,286	
682,550 (Clinker)		Baghouse #3	300,000	155,273	
1119,382 (Dry Kiln Feed)	Tons				

EMISSION CALCULATIONS

Source of Emission Factor AP-42, 5th Ed., Sec. 11.6.2, Coal SO_2 Analysis.	**Allowable or Permissible Emission Limit**	PFE-26-0189-0051-I-II-C	**Units**
	TSP AND PM10:	134.50	tons/year
List other worksheets used with this form.	SO_2	450.00	tons/year
Used Oil as Fuel 1194541 Gal. Ton. 4064.862	NO_x	1,433.00	tons/year

Air Pollutant	Emission Factor (Lbs/Unit)	Control Efficiency (%)	Actual Emissions (Lbs/Hr)	Actual Emissions (Tons/Yr)	Maximum Controlled (Tons/Yr)	Maximum Uncontrolled (Tons/Yr)	Allowable Emissions (Tons/Yr)
TSP	0.34 + 0.012	99.9	NA	102.88	NA	NA	134.50
PM10	0.34 + 0.012	99.9	NA	102.88	NA	NA	134.50
SOx		NA	NA	297.29	NA	NA	450.00
NOx	4.2	NA	NA	1,205.54	NA	NA	1,433.00
VOC	0.120	NA	NA	34.44	NA	40.95	NA
CO	3.700	NA	NA	1,062.02	NA	1,262.72	NA
Lead	7.50E-05	NA	NA	0.02	NA	0.03	NA

ADDITIONAL NOTES

Particulate matter emission factor is sum of Kiln and CC emission factors times the clinker production, plus the Roller Mill emission factor times the Dry kiln feed.
Dry kiln feed throughputs are equal to Roller Mill Circuit (EU301) throughputs.
Roller Mill Hours equal to Roller Mill Circuit (EU301) hours. Kiln hours from SJC 2003 operating report.
The NO_x, TSP, CO, VOC, and PM_{10} emission factors are for a preheater/precalciner kiln.
Annual SO2 emissions based on 0.74% (2003 average) Sulfur in Coal and 0.5% Sulfur in the Fuel Oil and 75% absorption into clinker (AP-42, Supplement 5, page 11.6-6).
Max SO_2 based on 1% sulfur in 90,000 TPY coal and 0.5% sulfur in Fuel oil #2 permit limit.
Allowable emissions based on application for permit to construct PFE-26-0189-0051-I-II-C and letter from I. H. Flashman (attorney for SJC) to F. Claudio (EQB) dated 3/18/97.

Facility Emissions Summary Table

Facility Name	Facility ID No.		Unit No.	Year of Data
ESSROC- San Juan Plant			EU501	2004

POINT IDENTIFICATION

Facility SIC Code 3241	**Point Description** Preheater / Kiln	
Source Classification Code (SCC) 30500613, 30500622, 30500614	**Emission Factor Unit** Clinker Produced	**Actual Hours Operated in 2004** 6,428 Roller Mill
Source Description Roller Mill, Kiln	**Emission Point No.** EP501,EP502	**Actual Hours Operated in 2004** 7,583 Kiln

AIR POLLUTION CONTROL EQUIPMENT

Device No.	Description of Control Device	Pollutant	Efficiency (%)
CD501	Baghouse #2	Particulate	99.9
CD502	Baghouse #3	Particulate	99.9

PROCESS INFORMATION

Annual Throughput	**Units**	Fuel Oil Used for preheating (gal):		5,600	
578,092 (Clinker)	Tons	Fuel Oil Used for preheating (ton):		21	
889,514 (Dry Kiln Feed)		**Baghouse**	**Flow Rate (ACFM)**	**Flow Rate (DSCFM)**	
Maximum Annual Throughput	**Units**	Baghouse #2	210,000	108,286	
682,550 (Clinker)		Baghouse #3	300,000	155,273	
1119,382 (Dry Kiln Feed)	Tons				

EMISSION CALCULATIONS

Source of Emission Factor AP-42, 5th Ed., Sec. 11.6.2, Coal SO_2 Analysis.	**Allowable or Permissible Emission Limit**	PFE-26-0189-0051-I-II-C	**Units**
	TSP AND PM10:	134.50	tons/year
List other worksheets used with this form.	SO_2	450.00	tons/year
Used Oil as Fuel 736255 Gal. Ton. 2505.377	NO_x	1,433.00	tons/year

Air Pollutant	Emission Factor (Lbs/Unit)	Control Efficiency (%)	Actual Emissions (Lbs/Hr)	Actual Emissions (Tons/Yr)	Maximum Controlled (Tons/Yr)	Maximum Uncontrolled (Tons/Yr)	Allowable Emissions (Tons/Yr)
TSP	0.34 + 0.012	99.9	NA	103.61	NA	NA	134.50
PM10	0.34 + 0.012	99.9	NA	103.61	NA	NA	134.50
SOx		NA	NA	299.74	NA	NA	450.00
NOx	4.2	NA	NA	1,213.99	NA	NA	1,433.00
VOC	0.120	NA	NA	34.69	NA	40.95	NA
CO	3.700	NA	NA	1,069.47	NA	1,262.72	NA
Lead	7.50E-05	NA	NA	0.02	NA	0.03	NA

ADDITIONAL NOTES

Particulate matter emission factor is sum of Kiln and CC emission factors times the clinker production, plus the Roller Mill emission factor times the Dry kiln feed.

Dry kiln feed throughputs are equal to Roller Mill Circuit (EU301) throughputs.

Roller Mill Hours equal to Roller Mill Circuit (EU301) hours. Kiln hours from SJC 2003 operating report.

The NO_x, TSP, CO, VOC, and PM_{10} emission factors are for a preheater/precalciner kiln.

Annual SO2 emissions based on 0.74% (2003 average) Sulfur in Coal and 0.5% Sulfur in the Fuel Oil and 75% absorption into clinker (AP-42, Supplement 5, page 11.6-6).

Max SO_2 based on 1% sulfur in 90,000 TPY coal and 0.5% sulfur in Fuel oil #2 permit limit.

Allowable emissions based on application for permit to construct PFE-26-0189-0051-I-II-C and letter from I. H. Flashman (attorney for SJC) to F. Claudio (EQB) dated 3/18/97.

Facility Emissions Summary Table

Facility Name	Facility ID No.		Unit No.	Year of Data
ESSROC- San Juan Plant			EU501	2005

POINT IDENTIFICATION

Facility SIC Code	Point Description	
3241	Preheater / Kiln	
Source Classification Code (SCC)	**Emission Factor Unit**	**Actual Hours Operated in 2005**
30500613, 30500623, 30500614	Clinker Produced	6,653 Roller Mill
Source Description	**Emission Point No.**	**Actual Hours Operated in 2005**
Roller Mill, Kiln	EP501,EP502	7,661 Kiln

AIR POLLUTION CONTROL EQUIPMENT

Device No.	Description of Control Device	Pollutant	Efficiency (%)
CD501	Baghouse #2	Particulate	99.9
CD502	Baghouse #3	Particulate	99.9

PROCESS INFORMATION

Annual Throughput	Units	Fuel Oil Used for preheating (gal):		17,636	
581,434 (Clinker)	Tons	Fuel Oil Used for preheating (ton):		73	
895,747 (Dry Kiln Feed)		**Baghouse**	**Flow Rate (ACFM)**	**Flow Rate (DSCFM)**	
Maximum Annual Throughput	**Units**	Baghouse #2	210,000	108,286	
682,550 (Clinker)		Baghouse #3	300,000	155,273	
1119,382 (Dry Kiln Feed)	Tons				

EMISSION CALCULATIONS

Source of Emission Factor	Allowable or Permissible Emission Limit	PFE-26-0189-0051-I-II-C	Units
AP-42, 5th Ed., Sec. 11.6.2, Coal SO_2 Analysis.	TSP AND PM10:	134.50	tons/year
List other throughputs used with this form.	SO_2	450.00	tons/year
Used Oil as Fuel 1599327 Gal. Ton. 5731	NO_x	1,433.00	tons/year

Air Pollutant	Emission Factor (Lbs/Unit)	Control Efficiency (%)	Actual Emissions (Lbs/Hr)	Actual Emissions (Tons/Yr)	Maximum Controlled (Tons/Yr)	Maximum Uncontrolled (Tons/Yr)	Allowable Emissions (Tons/Yr)
TSP	0.34 + 0.012	99.9	NA	104.22	NA	NA	134.50
PM10	0.34 + 0.012	99.9	NA	104.22	NA	NA	134.50
SOx	See add. notes	NA	NA	348.09	NA	NA	450.00
NOx	4.2	NA	NA	1,221.01	NA	NA	1,433.00
VOC	0.120	NA	NA	34.89	NA	40.95	NA
CO	3.700	NA	NA	1,075.65	NA	1,262.72	NA
Lead	7.50E-05	NA	NA	0.02	NA	0.03	NA

ADDITIONAL NOTES

Particulate matter emission factor is sum of Kiln and CC emission factors times the clinker production, plus the Roller Mill emission factor times the Dry kiln feed.

Dry kiln feed throughputs are equal to Roller Mill Circuit (EU301) throughputs.

Roller Mill Hours equal to Roller Mill Circuit (EU301) hours. Kiln hours from SJC 2005 operating report.

The NO_x, TSP, CO, VOC, and PM_{10} emission factors are for a preheater/precalciner kiln.

Annual SO2 emissions based on 0.83% (2005 average) Sulfur in Coal and 0.5% Sulfur in the Fuel Oil and 75% absorption into clinker (AP-42, Supplement 5, page 11.6-6).

Max SO_2 based on 1% sulfur in 90,000 TPY coal and 0.5% sulfur in Fuel oil #2 permit limit.

Allowable emissions based on application for permit to construct PFE-26-0189-0051-I-II-C and letter from I. H. Flashman (attorney for SJC) to F. Claudio (EQB) dated 3/18/97.

Facility Emissions Summary Table

Facility Name	Facility ID No.		Unit No.	Year of Data
ESSROC- San Juan Plant			EU501	2006

POINT IDENTIFICATION

Facility SIC Code 3241	**Point Description** Preheater / Kiln	
Source Classification Code (SCC) 30500613, 30500623, 30500614	**Emission Factor Unit** Clinker Produced	**Actual Hours Operated in 2006** 6,360 Roller Mill
Source Description Roller Mill, Kiln	**Emission Point No.** EP501,EP502	**Actual Hours Operated in 2006** 6,360 Kiln

AIR POLLUTION CONTROL EQUIPMENT

Device No.	Description of Control Device	Pollutant	Efficiency (%)
CD501	Baghouse #2	Particulate	99.9
CD502	Baghouse #3	Particulate	99.9

PROCESS INFORMATION

Annual Throughput	Units	Fuel Oil Used for preheating (gal):		10,933	
562,663 (Clinker) 866,603 (Dry Kiln Feed)	Tons	Fuel Oil Used for preheating (ton):		41	
		Baghouse	**Flow Rate (ACFM)**	**Flow Rate (DSCFM)**	
Maximum Annual Throughput	**Units**	Baghouse #2	210,000	108,286	
682,550 (Clinker) 1119,382 (Dry Kiln Feed)	Tons	Baghouse #3	300,000	155,273	

EMISSION CALCULATIONS

Source of Emission Factor	Allowable or Permissible Emission Limit	PFE-26-0189-0051-I-II-C	Units
AP-42, 5th Ed., Sec. 11.6.2, Coal SO_2 Analysis.	TSP AND PM10:	134.50	tons/year
List other throughputs used with this form.	SO_2	450.00	tons/year
Used Oil as Fuel 10,933 Gal. Ton. 41	NO_x	1,433.00	tons/year

Air Pollutant	Emission Factor (Lbs/Unit)	Control Efficiency (%)	Actual Emissions (Lbs/Hr)	Actual Emissions (Tons/Yr)	Maximum Controlled (Tons/Yr)	Maximum Uncontrolled (Tons/Yr)	Allowable Emissions (Tons/Yr)
TSP	0.34 + 0.012	99.9	NA	100.85	NA	NA	134.50
PM10	0.34 + 0.012	99.9	NA	100.85	NA	NA	134.50
SOx	See add. notes	NA	NA	340.35	NA	NA	450.00
NOx	4.2	NA	NA	1,181.59	NA	NA	1,433.00
VOC	0.120	NA	NA	33.76	NA	40.95	NA
CO	3.700	NA	NA	1,040.93	NA	1,262.72	NA
Lead	7.50E-05	NA	NA	0.02	NA	0.03	NA

ADDITIONAL NOTES

Particulate matter emission factor is sum of Kiln and CC emission factors times the clinker production, plus the Roller Mill emission factor times the Dry kiln feed.

Dry kiln feed throughputs are equal to Roller Mill Circuit (EU301) throughputs.

Roller Mill Hours equal to Roller Mill Circuit (EU301) hours. Kiln hours from SJC 2006 operating report.

The NO_x, TSP, CO, VOC, and PM_{10} emission factors are for a preheater/precalciner kiln.

Annual SO2 emissions based on 0.83% (2006 average) Sulfur in Coal and 0.5% Sulfur in the Fuel Oil and 75% absorption into clinker (AP-42, Supplement 5, page 11.6-6).

Max SO_2 based on 1% sulfur in 90,000 TPY coal and 0.5% sulfur in Fuel oil #2 permit limit.

Allowable emissions based on application for permit to construct PFE-26-0189-0051-I-II-C and letter from I. H. Flashman (attorney for SJC) to F. Claudio (EQB) dated 3/18/97.

Facility Name	Facility ID No.		Unit No.	Year of Data
ESSROC- San Juan Plant			EU501	2007

POINT IDENTIFICATION

Facility SIC Code 3241	**Point Description** Preheater / Kiln	
Source Classification Code (SCC) 30500613, 30500623, 30500614	**Emission Factor Unit** Clinker Produced	**Actual Hours Operated in 2007** 4,662 Roller Mill
Source Description Roller Mill, Kiln	**Emission Point No.** EP501,EP502	**Actual Hours Operated in 2007** 5,030 Kiln

AIR POLLUTION CONTROL EQUIPMENT

Device No.	Description of Control Device	Pollutant	Efficiency (%)
CD501	Baghouse #2	Particulate	99.9

PROCESS INFORMATION

Annual Throughput	Units	Fuel Oil Used for preheating (gal):		3,734	
409,325 (Clinker) 631,458 (Dry Kiln Feed)	Tons	Fuel Oil Used for preheating (ton):		14	
		Baghouse	Flow Rate (ACFM)	Flow Rate (DSCFM)	
Maximum Annual Throughput 682,550 (Clinker) 1119,382 (Dry Kiln Feed)	Units Tons	Baghouse #2	460,000	237,197	

EMISSION CALCULATIONS

Source of Emission Factor	Allowable or Permissible Emission Limit PFE-26-0189-0051-I-II-C		Units
AP-42, 5th Ed., Sec. 11.6.2, Coal SO_2 Analysis.	TSP AND PM10:	134.50	tons/year
List other throughputs used with this form.	SO_2	450.00	tons/year
Used Oil as Fuel 3,734 Gal. Ton. 14	NO_x	1,433.00	tons/year

Air Pollutant	Emission Factor (Lbs/Unit)	Control Efficiency (%)	Actual Emissions (Lbs/Hr)	Actual Emissions (Tons/Yr)	Maximum Controlled (Tons/Yr)	Maximum Uncontrolled (Tons/Yr)	Allowable Emissions (Tons/Yr)
TSP	0.34 + 0.012	99.9	NA	73.37	NA	NA	134.50
PM10	0.34 + 0.012	99.9	NA	73.37	NA	NA	134.50
SOx	See add. notes	NA	NA	248.89	NA	NA	450.00
NOx	4.2	NA	NA	859.58	NA	NA	1,433.00
VOC	0.120	NA	NA	24.56	NA	40.95	NA
CO	3.700	NA	NA	757.25	NA	1,262.72	NA
Lead	7.50E-05	NA	NA	0.02	NA	0.03	NA

ADDITIONAL NOTES

Particulate matter emission factor is sum of Kiln and CC emission factors times the clinker production, plus the Roller Mill emission factor times the Dry kiln feed.

Dry kiln feed throughputs are equal to Roller Mill Circuit (EU301) throughputs.

Roller Mill Hours equal to Roller Mill Circuit (EU301) hours. Kiln hours from SJC 2007 operating report.

The NO_x, TSP, CO, VOC, and PM_{10} emission factors are for a preheater/precalciner kiln.

Annual SO2 emissions based on 0.83% (2007 average) Sulfur in Coal and 0.5% Sulfur in the Fuel Oil and 75% absorption into clinker (AP-42, Supplement 5, page 11.6-6).

Max SO_2 based on 1% sulfur in 90,000 TPY coal and 0.5% sulfur in Fuel oil #2 permit limit.

Allowable emissions based on application for permit to construct PFE-26-0189-0051-I-II-C and letter from I. H. Flashman (attorney for SJC) to F. Claudio (EQB) dated 3/18/97.

Essroc San Juan Inc. **DORADO CEMENT PLANT**

Facility Name	Facility ID No.		Unit No.	Year of Data
ESSROC- San Juan Plant			EU501	2008

POINT IDENTIFICATION

Facility SIC Code 3241	**Point Description** Preheater / Kiln	
Source Classification Code (SCC) 30500613, 30500623, 30500614	**Emission Factor Unit** Clinker Produced	**Actual Hours Operated in 2008** 4,250 Roller Mill
Source Description Roller Mill, Kiln	**Emission Point No.** EP501,EP502	**Actual Hours Operated in 2008** 5,246 Kiln

AIR POLLUTION CONTROL EQUIPMENT

Device No.	Description of Control Device	Pollutant	Efficiency (%)
CD501	Baghouse #2	Particulate	99.9

PROCESS INFORMATION

Annual Throughput	Units	Fuel Oil Used for preheating (gal):		33	
362,846 (Clinker) 558,858 (Dry Kiln Feed)	Tons	Fuel Oil Used for preheating (ton):		14	
		Baghouse	**Flow Rate (ACFM)**	**Flow Rate (DSCFM)**	
Maximum Annual Throughput	**Units**	Baghouse #2	460,000	237,197	
682,550 (Clinker) 1119,382 (Dry Kiln Feed)	Tons				

EMISSION CALCULATIONS

Source of Emission Factor	Allowable or Permissible Emission Limit	PFE-26-0189-0051-I-II-C	Units
AP-42, 5th Ed., Sec. 11.6.2, Coal SO_2 Analysis.	TSP AND PM10:	134.50	tons/year
List other throughputs used with this form.	SO_2	450.00	tons/year
Used Oil as Fuel 33 Gal. Ton. 14	NO_x	1,433.00	tons/year

Air Pollutant	Emission Factor (Lbs/Unit)	Control Efficiency (%)	Actual Emissions (Lbs/Hr)	Actual Emissions (Tons/Yr)	Maximum Controlled (Tons/Yr)	Maximum Uncontrolled (Tons/Yr)	Allowable Emissions (Tons/Yr)
TSP	0.34 + 0.012	99.9	NA	65.04	NA	NA	134.50
PM10	0.34 + 0.012	99.9	NA	65.04	NA	NA	134.50
SOx	See add. notes	NA	NA	236.48	NA	NA	450.00
NOx	4.2	NA	NA	761.98	NA	NA	1,433.00
VOC	0.120	NA	NA	21.77	NA	40.95	NA
CO	3.700	NA	NA	671.27	NA	1,262.72	NA
Lead	7.50E-05	NA	NA	0.01	NA	0.03	NA

ADDITIONAL NOTES

Particulate matter emission factor is sum of Kiln and CC emission factors times the clinker production, plus the Roller Mill emission factor times the Dry kiln feed.

Dry kiln feed throughputs are equal to Roller Mill Circuit (EU301) throughputs.

Roller Mill Hours equal to Roller Mill Circuit (EU301) hours. Kiln hours from SJC 2008 operating report.

The NO_x, TSP, CO, VOC, and PM_{10} emission factors are for a preheater/precalciner kiln.

Annual SO2 emissions based on 0.83% (2008 average) Sulfur in Coal and 0.5% Sulfur in the Fuel Oil and 75% absorption into clinker (AP-42, Supplement 5, page 11.6-6).

Max SO_2 based on 1% sulfur in 90,000 TPY coal and 0.5% sulfur in Fuel oil #2 permit limit.

Allowable emissions based on application for permit to construct PFE-26-0189-0051-I-II-C and letter from I. H. Flashman (attorney for SJC) to F. Claudio (EQB) dated 3/18/97.

Facility Name	Facility ID No.		Unit No.	Year of Data
ESSROC- San Juan Plant			EU501	2009

POINT IDENTIFICATION

Facility SIC Code 3241	**Point Description** Preheater / Kiln	
Source Classification Code (SCC) 30500613, 30500623, 30500614	**Emission Factor Unit** Clinker Produced	**Actual Hours Operated in 2009** 3,511 Roller Mill
Source Description Roller Mill, Kiln	**Emission Point No.** EP501,EP502	**Actual Hours Operated in 2009** 4,326 Kiln

AIR POLLUTION CONTROL EQUIPMENT

Device No.	Description of Control Device	Pollutant	Efficiency (%)
CD501	Baghouse #2	Particulate	99.9

PROCESS INFORMATION

Annual Throughput	Units	Fuel Oil Used for preheating (gal):		39	
311,546 (Clinker) 479,781 (Dry Kiln Feed)	Tons	Fuel Oil Used for preheating (ton):			
		Baghouse	**Flow Rate (ACFM)**	**Flow Rate (DSCFM)**	
Maximum Annual Throughput 682,550 (Clinker) 1119,382 (Dry Kiln Feed)	**Units** Tons	Baghouse #2	460,000	237,197	

EMISSION CALCULATIONS

Source of Emission Factor	Allowable or Permissible Emission Limit	PFE-26-0189-0051-I-II-C	Units
AP-42, 5th Ed., Sec. 11.6.2, Coal SO_2 Analysis.	TSP AND PM10:	134.50	tons/year
List other throughputs used with this form.	SO_2	450.00	tons/year
Used Oil as Fuel 39 Gal. Ton.	NO_x	1,433.00	tons/year

Air Pollutant	Emission Factor (Lbs/Unit)	Control Efficiency (%)	Actual Emissions (Lbs/Hr)	Actual Emissions (Tons/Yr)	Maximum Controlled (Tons/Yr)	Maximum Uncontrolled (Tons/Yr)	Allowable Emissions (Tons/Yr)
TSP	0.34 + 0.012	99.9	NA	55.84	NA	NA	134.50
PM10	0.34 + 0.012	99.9	NA	55.84	NA	NA	134.50
SOx	See add. notes	NA	NA	191.80	NA	NA	450.00
NOx	4.2	NA	NA	654.25	NA	NA	1,433.00
VOC	0.120	NA	NA	18.69	NA	40.95	NA
CO	3.700	NA	NA	576.36	NA	1,262.72	NA
Lead	7.50E-05	NA	NA	0.01	NA	0.03	NA

ADDITIONAL NOTES

Particulate matter emission factor is sum of Kiln and CC emission factors times the clinker production, plus the Roller Mill emission factor times the Dry kiln feed.

Dry kiln feed throughputs are equal to Roller Mill Circuit (EU301) throughputs.

Roller Mill Hours equal to Roller Mill Circuit (EU301) hours. Kiln hours from SJC 2009 operating report.

The NO_x, TSP, CO, VOC, and PM_{10} emission factors are for a preheater/precalciner kiln.

Annual SO2 emissions based on 0.83% (2009 average) Sulfur in Coal and 0.5% Sulfur in the Fuel Oil and 75% absorption into clinker (AP-42, Supplement 5, page 11.6-6).

Max SO_2 based on 1% sulfur in 90,000 TPY coal and 0.5% sulfur in Fuel oil #2 permit limit.

Allowable emissions based on application for permit to construct PFE-26-0189-0051-I-II-C and letter from I. H. Flashman (attorney for SJC) to F. Claudio (EQB) dated 3/18/97.

Facility Name	Facility ID No.		Unit No.	Year of Data
ESSROC- San Juan Plant			EU501	2010

POINT IDENTIFICATION

Facility SIC Code 3241	**Point Description** Preheater / Kiln	
Source Classification Code (SCC) 30500613, 30500623, 30500614	**Emission Factor Unit** Clinker Produced	**Actual Hours Operated in 2010** 2,763 Roller Mill
Source Description Roller Mill, Kiln	**Emission Point No.** EP501,EP502	**Actual Hours Operated in 2010** 3,855 Kiln

AIR POLLUTION CONTROL EQUIPMENT

Device No.	Description of Control Device	Pollutant	Efficiency (%)
CD501	Baghouse #2	Particulate	99.9

PROCESS INFORMATION

Annual Throughput	Units	Fuel Oil Used for preheating (gal):		39	
255,288 (Clinker) 393,160 (Dry Kiln Feed)	Tons	Fuel Oil Used for preheating (ton):			
		Baghouse	Flow Rate (ACFM)	Flow Rate (DSCFM)	
Maximum Annual Throughput	**Units**	Baghouse #2	460,000	237,197	
682,550 (Clinker) 1119,382 (Dry Kiln Feed)	Tons				

EMISSION CALCULATIONS

Source of Emission Factor	Allowable or Permissible Emission Limit	PFE-26-0189-0051-I-II-C	Units
AP-42, 5th Ed., Sec. 11.6.2, Coal SO_2 Analysis.	TSP AND PM10:	134.50	tons/year
List other throughputs used with this form.	SO_2	450.00	tons/year
Used Oil as Fuel 39 Gal. Ton.	NO_x	1,433.00	tons/year

Air Pollutant	Emission Factor (Lbs/Unit)	Control Efficiency (%)	Actual Emissions (Lbs/Hr)	Actual Emissions (Tons/Yr)	Maximum Controlled (Tons/Yr)	Maximum Uncontrolled (Tons/Yr)	Allowable Emissions (Tons/Yr)
TSP	0.34 + 0.012	99.9	NA	45.76	NA	NA	134.50
PM10	0.34 + 0.012	99.9	NA	45.76	NA	NA	134.50
SOx	See add. notes	NA	NA	166.86	NA	NA	450.00
NOx	4.2	NA	NA	536.10	NA	NA	1,433.00
VOC	0.120	NA	NA	15.32	NA	40.95	NA
CO	3.700	NA	NA	472.28	NA	1,262.72	NA
Lead	7.50E-05	NA	NA	0.01	NA	0.03	NA

ADDITIONAL NOTES

Particulate matter emission factor is sum of Kiln and CC emission factors times the clinker production, plus the Roller Mill emission factor times the Dry kiln feed.

Dry kiln feed throughputs are equal to Roller Mill Circuit (EU301) throughputs.

Roller Mill Hours equal to Roller Mill Circuit (EU301) hours. Kiln hours from SJC 2010 operating report.

The NO_x, TSP, CO, VOC, and PM_{10} emission factors are for a preheater/precalciner kiln.

Annual SO2 emissions based on 0.83% (2010 average) Sulfur in Coal and 0.5% Sulfur in the Fuel Oil and 75% absorption into clinker (AP-42, Supplement 5, page 11.6-6).

Max SO_2 based on 1% sulfur in 90,000 TPY coal and 0.5% sulfur in Fuel oil #2 permit limit.

Allowable emissions based on application for permit to construct PFE-26-0189-0051-I-II-C and letter from I. H. Flashman (attorney for SJC) to F. Claudio (EQB) dated 3/18/97.

Facility Name	Facility ID No.		Unit No.	Year of Data
ESSROC- San Juan Plant			EU501	2010

POINT IDENTIFICATION

Facility SIC Code 3241	**Point Description** Preheater / Kiln	
Source Classification Code (SCC) 30500613, 30500623, 30500614	**Emission Factor Unit** Clinker Produced	**Actual Hours Operated in 2010** 2,763 Roller Mill
Source Description Roller Mill, Kiln	**Emission Point No.** EP501,EP502	**Actual Hours Operated in 2010** 3,855 Kiln

AIR POLLUTION CONTROL EQUIPMENT

Device No.	Description of Control Device	Pollutant	Efficiency (%)
CD501	Baghouse #2	Particulate	99.9

PROCESS INFORMATION

Annual Throughput	Units	Fuel Oil Used for preheating (gal):		39	
255,288 (Clinker) 393,160 (Dry Kiln Feed)	Tons	Fuel Oil Used for preheating (ton):			
		Baghouse	**Flow Rate (ACFM)**	**Flow Rate (DSCFM)**	
Maximum Annual Throughput 682,550 (Clinker) 1119,382 (Dry Kiln Feed)	**Units** Tons	Baghouse #2	460,000	237,197	

EMISSION CALCULATIONS

Source of Emission Factor	Allowable or Permissible Emission Limit	PFE-26-0189-0051-I-II-C	Units
AP-42, 5th Ed., Sec. 11.6.2, Coal SO_2 Analysis.	TSP AND PM10:	134.50	tons/year
List other throughputs used with this form.	SO_2	450.00	tons/year
Used Oil as Fuel 39 Gal. Ton.	NO_x	1,433.00	tons/year

Air Pollutant	Emission Factor (Lbs/Unit)	Control Efficiency (%)	Actual Emissions (Lbs/Hr)	Actual Emissions (Tons/Yr)	Maximum Controlled (Tons/Yr)	Maximum Uncontrolled (Tons/Yr)	Allowable Emissions (Tons/Yr)
TSP	0.34 + 0.012	99.9	NA	45.76	NA	NA	134.50
PM10	0.34 + 0.012	99.9	NA	45.76	NA	NA	134.50
SOx	See add. notes	NA	NA	166.86	NA	NA	450.00
NOx	4.2	NA	NA	536.10	NA	NA	1,433.00
VOC	0.120	NA	NA	15.32	NA	40.95	NA
CO	3.700	NA	NA	472.28	NA	1,262.72	NA
Lead	7.50E-05	NA	NA	0.01	NA	0.03	NA

ADDITIONAL NOTES

Particulate matter emission factor is sum of Kiln and CC emission factors times the clinker production, plus the Roller Mill emission factor times the Dry kiln feed.

Dry kiln feed throughputs are equal to Roller Mill Circuit (EU301) throughputs.

Roller Mill Hours equal to Roller Mill Circuit (EU301) hours. Kiln hours from SJC 2010 operating report.

The NO_x, TSP, CO, VOC, and PM_{10} emission factors are for a preheater/precalciner kiln.

Annual SO2 emissions based on 0.83% (2010 average) Sulfur in Coal and 0.5% Sulfur in the Fuel Oil and 75% absorption into clinker (AP-42, Supplement 5, page 11.6-6).

Max SO_2 based on 1% sulfur in 90,000 TPY coal and 0.5% sulfur in Fuel oil #2 permit limit.

Allowable emissions based on application for permit to construct PFE-26-0189-0051-I-II-C and letter from I. H. Flashman (attorney for SJC) to F. Claudio (EQB) dated 3/18/97.